SUMMARY OF
SALTON SEA HYDROLOGY AND FUTURE SCENARIOS

The hydrology of the Salton Sea is primarily related to inflows and evaporation, and controls the size and elevation of the current Salton Sea and influences the performance of the Ecosystem Restoration Alternatives. This Summary Sheet briefly describes the hydrology of the Salton Sea and future changes considered in the Salton Sea Ecosystem Restoration Study.

SALTON SEA WATERSHED AND HISTORICAL HYDROLOGY

The Salton Sea watershed encompasses an area of approximately 8,000 square miles from San Bernardino County in the north to the Mexicali Valley (Republic of Mexico) to the south (as shown in Figure 1). The Salton Sea lies at the lowest point in the watershed and collects runoff and agricultural drainage from most of Imperial County, much of Riverside County, small portions of San Bernardino and San Diego Counties, as well as the northern portion of the Mexicali Valley. Average annual rainfall at the Salton Sea is approximately 2.7 inches per year, while evaporation is approximately 69 inches per year.

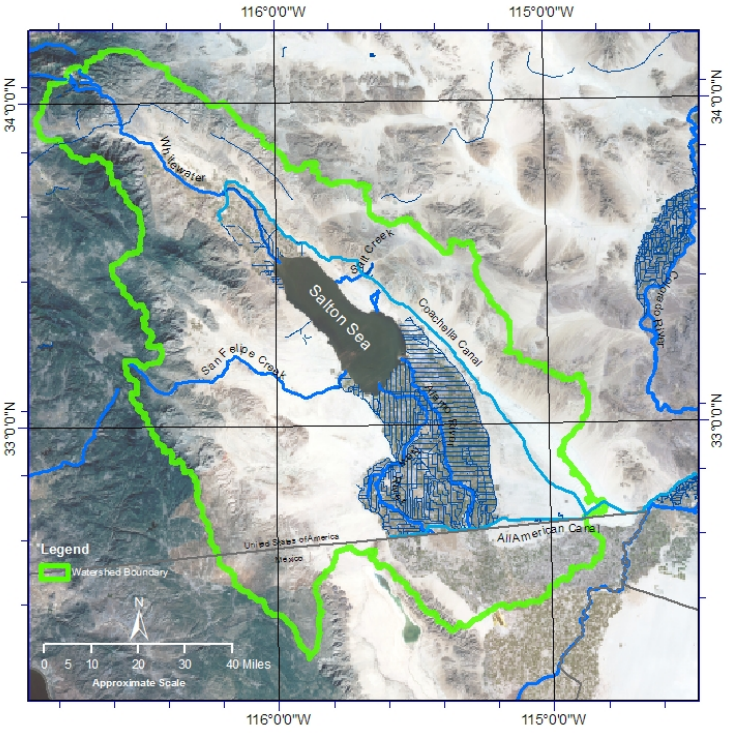

Figure 1
Salton Sea Watershed

The principal sources of inflow to the Salton Sea include: the Alamo River, New River, Whitewater River/Coachella Valley Storm Channel, direct drainage from Imperial and Coachella Valleys, subsurface inflow from groundwater, San Felipe Creek, Salt Creek, other smaller local drainages, and direct precipitation on the Salton Sea. The historical total inflow (average over 1950-2002) to the Salton Sea is estimated to be approximately 1.3 million acre-feet per year. Evaporation is the principal component of water loss from the Salton Sea and is approximately equal to the total inflows at a stable elevation. Imperial Valley drainage accounts for over 75 percent of the historical inflow to the Salton Sea, the Mexicali and Coachella Valleys each contribute nearly 10 percent, and the local watershed and direct precipitation contribute approximately 5 percent.

IMPORTANCE OF INFLOWS

The future inflows to the Salton Sea determine the water budget that can be allocated to various components of restoration alternatives. For example, under most Ecosystem Restoration Alternatives, components such as Saline Habitat Complex, Air Quality Management, and Marine Sea areas all require water. The projections of future inflows will influence the design of various project components and will affect the overall performance of the alternatives.

REASONABLE AND FORESEEABLE FUTURE CHANGES TO SALTON SEA INFLOWS

Inflows to the Salton Sea in the future will be substantially reduced due to water management decisions throughout the Salton Sea watershed and beyond. The California Environmental Quality Act (CEQA) requires development of a No Action Alternative that reflects existing conditions plus changes which are reasonably expected to occur in the foreseeable future if the project is not implemented. These conditions are represented by the No Action Alternative - CEQA Conditions. Projects considered in the No Action Alternative - CEQA Conditions are limited to those that have already undergone environmental review, such as:

- Quantification Settlement Agreement
- Imperial Irrigation District Water Conservation and Transfer Project
- Coachella Canal and All-American Canal Lining Projects
- Coachella Valley Water Management Plan
- Mexicali Wastewater Conveyance and Treatment Project
- Mexicali Power Plant Projects.

These projects will change the flow to the Salton Sea. Based on historic variability in climate conditions, recent land and water use, and the “reasonably, foreseeable” projects listed above, the estimated total average annual future inflow to the Salton Sea is approximately 965,000 acre-feet per year for the 2003 to 2077 period and approximately 922,000 acre-feet per year for the 2018 to 2077 period. Because construction of most facilities in the Ecosystem Restoration Alternatives will probably not be completed until after 2018, the inflows used to develop the alternatives only consider the range of flows from 2018 to 2077.

ACCOUNTING FOR AN UNCERTAIN FUTURE

In most projects, the No Action Alternative is relatively easy to define. However, for this project, many additional projects and actions may occur in the 75-year Study Period that cannot be specifically defined as "reasonably expected." However, these projects and actions could substantially change the inflows to the Salton Sea. Therefore, a second No Action Alternative condition, the No Action Alternative -Variability Conditions, is described to present a range of estimates of future hydrology considering uncertainty in future conditions. The future hydrologic scenarios are necessary to bracket a

reasonable range of potential future hydrologic conditions that may influence the development or performance of alternative restoration strategies over the next 75 years.

Like most terminal lakes, the Salton Sea is highly sensitive to changes in inflows and climate conditions. For example, under current Salton Sea conditions a 10 percent reduction in inflows will cause a decline in the long-term water surface elevation of nearly 5 feet and create approximately 16,000 acres of newly-exposed playa. Given the exceptional sensitivity of Salton Sea conditions to projected inflows, it is imperative to consider a range of possible future conditions such that decisions regarding the future restoration of the Salton Sea and placement of major infrastructure elements accommodate future changes.

While the Salton Sea is wholly-dependent on the drain water flowing to the Salton Sea, it has no control over such flows nor over the conditions that produce such water. No water rights or guarantees of inflows currently exist that would reduce the risk of future changes in inflow to the Salton Sea. Many future changes are possible within the watershed over the 75-year study period that may cause reductions in inflows to the Salton Sea beyond those considered in the No Action Alternative - CEQA Conditions.

A risk-based approach was applied to bracket the range of ***possible*** future changes to Salton Sea inflows and describes the No Action Alternative - Variability Conditions. Under this approach, the major sources of uncertainty are identified and the range of possible inflow changes are described for each inflow source (Mexico, Imperial Valley, Coachella Valley, and Local watershed). Model simulations then sample the individual inflow ranges and generate thousands of traces of possible future hydrologic conditions. This approach to future uncertainty provides a broad suite of possible future hydrologic conditions that can be used to evaluate the performance and range of impacts of various restoration alternatives. The analytical approach was suggested by the stakeholder *Inflows/Modeling* working group and was adopted because the future of water management within the contributing areas over the 75-year planning horizon cannot be predicted with any great certainty. Nor can it be described by one inflow trace; there are multiple possible futures.

In assessing the range of future conditions, the analysis considered a variety of factors such as:

- Greater water use, reuse, and redirected discharges in Mexico
- Changes in on-farm water conservation and tailwater management
- Changes in water supply reliability and salinity
- Future regulatory requirements, increased demand, and changes in agricultural/urban water management practices
- Climate change effects on Salton Sea evaporation

The uncertainty associated with future Salton Sea inflows is expressed as range of possible values. The resulting range of inflows over time from all simulations is shown in Figure 2 and demonstrates the considerable uncertainty beyond the No Action Alternative – CEQA Conditions. The mean of all simulations of possible future

conditions for the No Action Alternative - Variability Conditions produced an average inflow of approximately 795,000 acre-feet per year for the 2003 to 2077 period and approximately 717,000 acre-feet per year for the period 2018 to 2077. For the purposes of the Ecosystem Restoration Alternatives, the 80 percent exceedance probability value for the 2018 to 2077 period (80 percent of all possible future simulations equaled or exceeded the specified value), approximately 650,000 acre-feet per year, has been selected for use in sizing and placement of major infrastructure elements. The average inflow values for the selected period were used rather than either a single year minimum or a "firm yield" concept due to the relative stability of projected inflows in the later period and the ability of the Sea to buffer monthly and annual inflow variations. A comparison of various average annual Salton Sea inflow values is shown in Figure 3. Table 1 shows the range of Salton Sea average annual inflows associated with the No Action Alternative – Variability Conditions.

Figure 2
Comparison of Total Salton Sea Estimated Future Inflows in No Action Alternative Scenarios

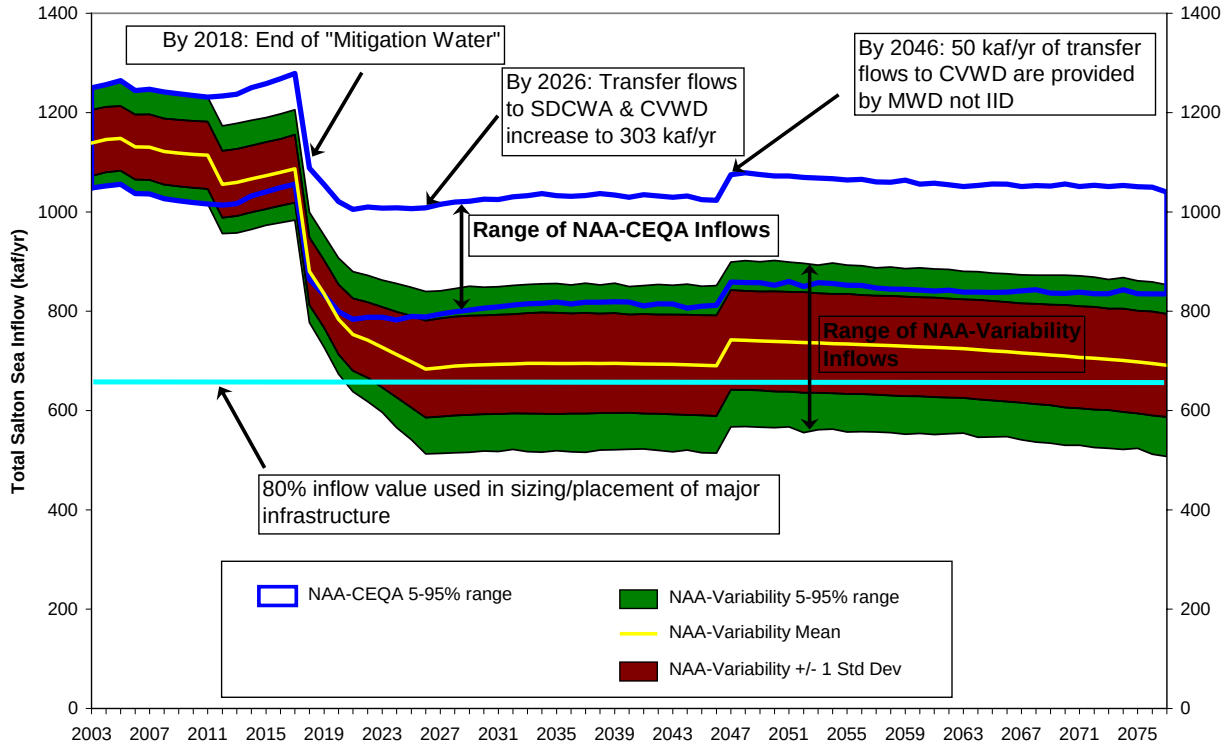

Figure 3
Total Salton Sea Average Inflows Considering Future Uncertainties

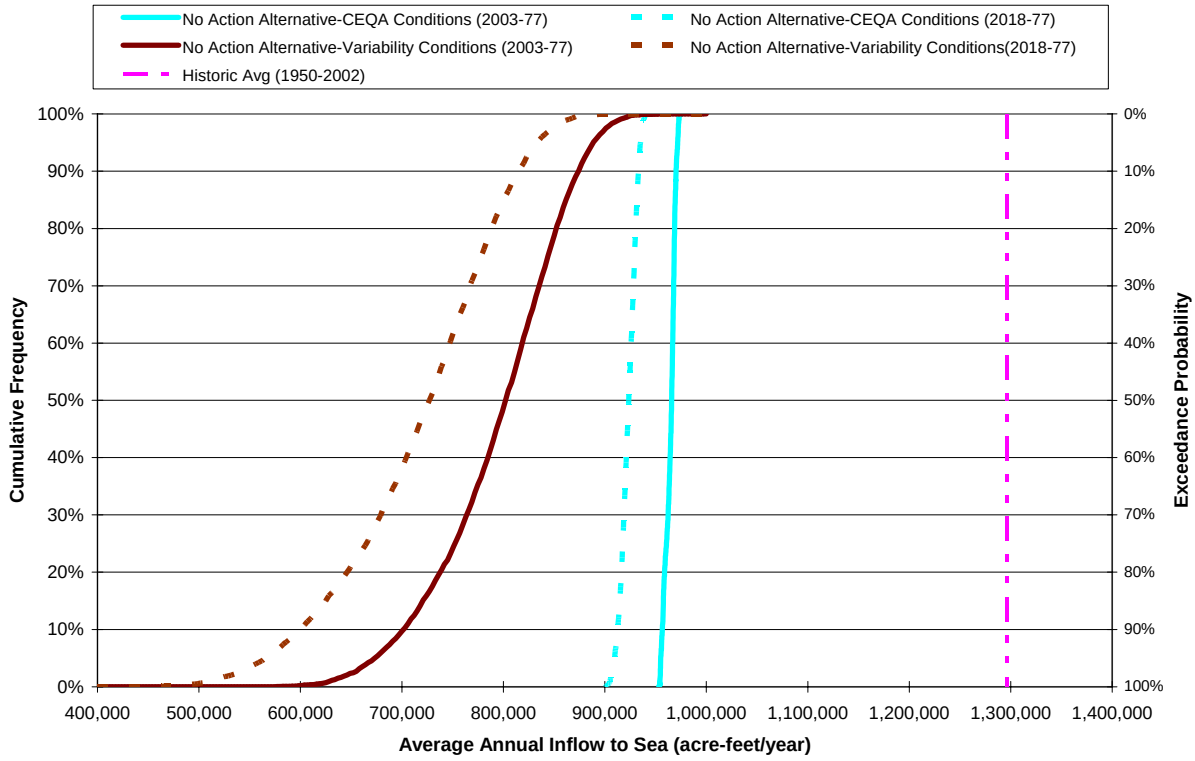

Table 1
Tabular Representation of Total Salton Sea Average Inflows Considering Future Uncertainties (acre-feet/yr)

Exceedance Probability	No Action Alternative-Variability Conditions (2003-2077)	No Action Alternative-Variability Conditions (2018-2077)
90%	700,000	600,000
80%	740,000	650,000
70%	770,000	680,000
60%	780,000	710,000
50%	800,000	730,000
40%	820,000	750,000
30%	840,000	770,000
20%	850,000	790,000
10%	870,000	820,000